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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/881,115	06/14/2001	Michael Lynn Hinds	15745-US	7919
30689 7590 06/19/2008 DEERE & COMPANY ONE JOHN DEERE PLACE MOLINE, IL 61265				
EXAMINER PANG, ROGER L				
ART UNIT		PAPER NUMBER		
3681				
MAIL DATE		DELIVERY MODE		
06/19/2008		PAPER		

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL LYNN HINDS¹

Appeal 2008-1277
Application 09/881,115
Technology Center 3600

Decided: June 19, 2008

Before JAMESON LEE, SALLY C. MEDLEY, and JAMES T. MOORE,
Administrative Patent Judges.

LEE, *Administrative Patent Judge.*

DECISION ON APPEAL

¹ The real party in interest is Deere & Company.

A. Statement of the Case

This is a decision on appeal by an Appellant under 35 U.S.C. § 134(a) from a final rejection of claims 1, 3, 4, 9, 11, and 12.² We have jurisdiction under 35 U.S.C. § 6(b).

References Relied on by the Examiner

Lehde	US 2,996,162	Aug. 15, 1961
Moskowitz	US 4,171,818	Oct. 23, 1979

The Rejection on Appeal

The Examiner rejected claims 1, 3, 4, 9, 11, and 12 under 35 U.S.C. § 103(a) as unpatentable over Lehde and Moskowitz.³

B. Issue

Has the Appellant shown error in the rejection of claims 1, 3, 4, 9, 11, and 12?

² Claims 5-8 and 13-16 have been indicated by the Examiner to contain allowable subject matter but are objected to as being dependent upon a rejected base claim. Those claims are not included in the appeal.

³ In the Final Rejection mailed September 15, 2004 and in the Advisory Action mailed November 30, 2004, the Examiner indicated claims 1, 3, 4, 9, 11, and 12 as rejected. (Final Rejection 2:20-21 and Advisory Action item 7.) In the Appeal Brief filed May 4, 2007, the Appellant acknowledged the status of claims 1, 3, 4, 9, 11, and 12 as rejected (Br. 1:19) and requested review on appeal of the rejections of those claims (Br. 3:21-24). In the Examiner's Answer mailed June 26, 2007, the Examiner indicated the statement of the status of claims contained in the brief is correct (Ans. 2:8), but has included only claims 1, 3, 9, and 11 in the statement of the grounds of rejection applicable to the appealed claims (Ans. 3:11-12). Based on the record before us, we understand claims 1, 3, 4, 9, 11, and 12 to be rejected and on appeal.

C. Summary of the Decision

The Appellant has not shown error in the rejection of claims 1, 3, 4, 9, 11, and 12.

D. Findings of Fact (Referenced as FF. ¶ No.)

1. The invention relates to magnetic devices for capturing ferric contaminants in lubricating fluids. (Spec. 1: ¶ 1.)

2. Claims 1 and 9 are independent and are reproduced below (App. Br. Claim. Appx. pp. 9-10):

1. In a gearbox containing gearing and having a low section having a bottom wall, a rotatable drive shaft extending through said bottom wall and being coupled to said gearing, and a seal located for preventing oil from leaking along an interface including a surface section of the shaft where it enters said bottom wall of the gearbox, the improvement comprising: a contaminant collector having magnetic characteristics being mounted in said gearbox for rotation with said shaft in a location closely adjacent a top surface of said seal so as to intercept and collect ferric contaminants before they engage the seal.

9. In a sugar cane base cutter assembly including a gearbox provided with an upper, horizontal section extending between and joining a pair of depending wells, each well having a bottom wall, an upper drive shaft section of a base cutter leg being rotatably mounted in each bottom wall, and a seal being located on each shaft section at an associated bottom wall for preventing leakage of oil from said gearbox along the shaft section, the improvement comprising: a contaminant collector having a magnetic characteristic being mounted for rotation with an associated one of said shaft sections at a location above and closely adjacent each seal so as to intercept ferric contaminants settling towards the associated seal.

3. The Examiner found the Jepson format of claim 1 to be an admission of prior art by the Appellant but lacking the feature of a containment collector (Ans. 3:12-17):

With regard to claim 1, applicant has disclosed a gearbox containing gearing and having a low section having a bottom wall, a rotatable drive shaft extending through said bottom wall, and being coupled to said gearing, and a seal located for preventing oil from leaking along an interface including a surface section of the shaft where it enters said bottom all of the gearbox as prior art (Jepson claim), but lacks the teaching of a contaminant collector.

4. The Examiner also found the Jepson format of claim 9 to be an admission of prior art by the Appellant but lacking the feature of a containment collector (Ans. 4:4-9):

With regard to claim 9, Applicant has disclosed a sugar cane base cutter assembly including a gearbox provided with an upper, horizontal section extending between and joining a pair of depending wells, each well having a bottom wall, and upper drive shaft section of a base cutter leg being rotatably mounted in each bottom wall and a seal being located on each shaft section at an associated bottom wall for preventing leakage of oil from said gearbox along the shaft section as prior art (Jepson claim), but lacks the teaching of a contaminant collector.

5. Lehde discloses devices for excluding magnetic particles from seals and bearings between two relatively rotatable parts or mechanisms. (Lehde 1:9-13.)

6. Lehde recognizes that shaft seals and bearings are seriously damaged and eventually destroyed by the abrading action of magnetic particles. (Lehde 1:22-24.)

7. In Lehde, a permanent magnet or an electromagnet creates an intense magnetic field between two adjacent magnetizable surfaces which are fixed to respective relatively rotatable parts. (Lehde 4:16-19.)

8. The Lehde device includes a coupling member 36 that presents a magnetizable surface 62 which may comprise a ring-shaped magnetizable plate having a spiraling rib formation 63 that is coaxial with an adjacent radial surface 61 of toroidal magnet assembly 60. (Lehde 8:37-43.)

9. A magnetic field is generated between the ribs 63 and the radial face 61 of the magnet 60 and is concentrated at the apices of the ribs. (Lehde 8:71-73.)

10. The magnetic field causes magnetic particles to collect or concentrate on the apices of the ribs 63. (Lehde 9:68-73; 8:74-75; 4:64-75.)

11. Relative rotation of the ribs 63 and the radial surface 61 of the magnet 60 causes those magnetic particles that have collected at the rib apices to be transported away from the adjacent bearing seal 35. (Lehde 8:57 to 9:12; 4:24-31.)

12. In describing the embodiment of Figure IV, Lehde states that motion of the particles away from the seals is produced “irrespective of the forces of gravity or centrifugal force.” (Lehde 6:59-62.)

13. Lehde also describes in the discussion of that embodiment that satisfactory motion of the magnetic particles results even when the rotating surface does not have the ribs. (Lehde 7:33-38.)

E. Principles of Law

Obviousness is a legal determination made on the basis of underlying factual inquiries including (1) the scope and content of the prior art; (2) the

differences between the claimed invention and the prior art; (3) the level of ordinary skill in the art. *Graham v. John Deere Co of Kansas City.*, 383 U.S. 1, 17 (1966). The Court in *Graham* further noted that “[s]uch secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.” 383 U.S. at 17-18.

One with ordinary skill in the art is presumed to have skills apart from what the prior art references explicitly say. *See In re Sovish*, 769 F.2d 738, 743 (Fed. Cir. 1985). “A person of ordinary skill in the art is also a person of ordinary creativity, not an automaton.” *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1742 (2007).

In an obviousness analysis, it is not necessary to find precise teachings in the prior art directed to the specific subject matter claimed because inferences and creative steps that a person of ordinary skill in the art would employ can be taken into account. *See KSR Int’l Co.*, 127 S.Ct. at 1741. A basis to combine teachings need not be expressly stated in any prior art reference. *See In re Kahn*, 441 F.3d 977, 989 (Fed. Cir. 2006). There need only be an articulated reasoning with rational underpinnings to support a motivation to combine teachings. *In re Kahn*, 441 F.3d at 988.

A combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. *KSR*, 127 S. Ct. at 1739. “[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious

unless its actual application is beyond his or her skill.” *KSR Int’l Co.*, 127 S. Ct. at 1740.

F. Analysis

The Appellant must show error in the decision of the Examiner in finally rejecting the claims on appeal. The Appellant has argued claims 1 and 9 collectively as one group and claims 3, 4, 11, and 12 collectively as another group. We turn first to claims 1 and 9.

Claims 1 and 9

In rejecting each of independent claims 1 and 9, the Examiner found the Jepson format of those claims to be an admission that the subject matter of the gearbox appearing in each preamble is the prior art work of another. (Ans. 3:12-17 and 4:4-9.) The Appellant does not dispute those findings. The Appellant does dispute that the combination of Lehde and Moskowitz with the Appellant’s prior art admission would result in the claimed improvement of a contaminant collector mounted for rotation on the rotatable drive shaft of the gearbox.

The Examiner found the Appellant’s prior art admissions in the preamble of each of claims 1 and 9 to lack the teaching of a contaminant collector. The Examiner turned to Lehde for the disclosure of a contaminant collector and reasoned (Ans. 3:19-22; 4:12-15):

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the gearbox of applicant’s prior art admission to employ a contaminant collector in view of Lehde in order to collect metal particles that may be contained in the lubricant in order to prevent wear on other parts (Col. 1).

However, the Examiner found that “Lehde lacks the teaching of said collector mounted for rotation with an associated one of said shaft sections at a location closely adjacent to the seal” (Ans. 3:22-24 and 4:15-16). To remedy that deficiency in Lehde, the Examiner pointed to Moskowitz as teaching a “contaminant collector 41 mounted to for [sic] rotation on a shaft 10 adjacent to a seal 32” (Ans. 3:24-25 and 4:17-18). The Examiner determined (Ans. 3:25 to 4:4 and 4:18-21):

It would have been obvious to one of ordinary skill at the time of the invention to modify Lehde to mount the collector for rotation on said shaft (thereby interchanging the spiral groove portion 63 and magnet 60) in view of Moskowitz, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

The Examiner further explained (Ans. 5:9-14):

This collector can be seen in Figure V, which is the structure of the disc 36' and magnet 60, and can also be seen in Figure VIII, which is the structure of disc 71 and magnetic structure 65/64. If the magnets/magnetic structures 60/(65/64) were interchanged with the discs 36'/71, the function of the invention would not be altered, and the teaching of the collector with magnetic characteristics, rotating with said shaft, would be taught. Moskowitz is only used to reinforce the teaching that a magnet/magnetic structure can be fixed to a shaft.

The Examiner also reasoned (Ans. 8:19 to 9:5):

The ejection of the contaminants is caused by the relative rotation between disc 36' and magnet 60 (see Col. 8). First, magnet 60 and disc 36' form a magnetic flux region that will collect the contaminants, and the relative rotation between the two parts, along with the ribs 63, will eject the contaminants. With the interchanging parts, magnet 60 would be fixed to the shaft 37, and the ribbed portion of the disc 36' would be attached to the housing. There would still be relative rotation and a magnetic flux would still be present, thereby collecting and expelling the contaminants.

As noted by the Examiner, Lehde discloses that it is the relative rotation of the surface 62 of disc 36' and the radial surface 61 of the magnet 60 that causes magnetic particles in the gap between those surfaces to be transported away from the adjacent bearing seal 35. (Lehde 8:57 to 9:12; 4:24-31.) The concentration of magnetic particles is facilitated by ribs that may be present on either or both of the surfaces. (Lehde 4:19-22.) A magnetic field generated between the surfaces results in lines of greatest magnetic intensity forming at the apices of the ribs. (Lehde 4:14-24.) Magnetic particles collect at the apices of the ribs 63 (Lehde 9:68-73; 8:73-75; 4:64-75) and are then swept away from shaft 37 and bearing seal 35 due to the relative rotation of the ribs 63 and surface 61 of magnet 60 (Lehde 9:1-12). In discussing the embodiment of Figure IV, Lehde states that motion of the particles away from the seals is produced "irrespective of the forces of gravity or centrifugal force." (Lehde 6:59-62.) Lehde also describes in the discussion of that embodiment that satisfactory motion of the magnetic particles results even when the rotating surface does not have the ribs. (Lehde 7:33-38.)

In an obviousness analysis, it is not necessary to find precise teachings in the prior art directed to the specific subject matter claimed because inferences and creative steps that a person of ordinary skill in the art would employ can be taken into account. *See KSR*, 127 S.Ct. at 1741. A basis to combine teachings need not be expressly stated in any prior art reference. *See In re Kahn*, 441 F.3d at 989. There need only be an articulated reasoning with rational underpinnings to support a motivation to combine teachings. *In re Kahn*, 441 F.3d at 988.

The Examiner's determination that a person of ordinary skill in the art would modify the Appellant's admitted prior art to incorporate the magnetic particle collector described in Lehde to prevent such particles from damaging the seal and bearing is rational. The Examiner's proposed rearrangement of the components that make up that collector, namely the disc 36' and magnet 60, would result in the magnet mounted for rotation with shaft 37 and the disc 36' with the spiraling ribs 63 fixed to housing 31. Lehde teaches that the functioning of the ribs in collecting and sweeping away the magnetic particles is not dependent on gravity or centrifugal force (Lehde 6:59-62) and does not require rotating ribs (Lehde 7:33-38.) It is the relative rotation between the disc 36' and magnet 60 that causes the magnetic particles to move. (Lehde 8:57 to 9:12; 4:24-31.) The Examiner's reasoning that the rearrangement would not change the function of those components in preventing contact of magnetic particles with the seal 35 is rational and is consistent with the teachings of Lehde. The Appellant does not address the Examiner's reasoning. No error has been shown.

The Appellant also disputes that that the prior art shows "contaminants" as claimed. The Examiner found the magnetic particles contained in the fluid of Lehde to be contaminants. (Ans. 3:17-22; 4:10-15.) The Appellant argues that because Lehde necessarily uses a flowable magnetic material containing magnetic particles to operate its magnetic brake/clutch assembly, those magnetic particles cannot be regarded as contaminants. (Br. 5:19-25.)

The term "contaminant" means "something that contaminates." Merriam Webster's Collegiate Dictionary 249 (10th ed. 1996). The term "contaminate" means "to make unfit for use by the introduction of

unwholesome or undesirable elements.” *Id.* Here, as noted by the Examiner (Ans. 7:14-18), Lehde explicitly states that shaft seals and bearings are seriously damaged and eventually destroyed by the abrading action of magnetic particles (Lehde 1:22-24) and seeks to keep those particles away from the seals and bearings (Lehde 1:68 to 2:4). In damaging or destroying the seals, the magnetic particles are understood to be undesirable elements that make the seals unfit and are reasonably considered to contaminate them. Therefore, no error has been shown in the Examiner’s determination that the magnetic particles described in Lehde are contaminants as claimed.

The Appellant also disputes that the prior art teaches a “collector” or serves to “collect” contaminants. The Examiner found the “collector” and “collect” limitations of the claims to be satisfied by the Lehde device in operating to exclude magnetic particles from seals and bearings. (Ans. 3:17-22; 4:10-15.) The Appellant argues that in Lehde the magnetic particles are “conveyed away” from the seal 35 and thus “collecting” does not occur. (Br. 6:12-28.)

The Examiner determined that Lehde teaches the magnetic particles are first collected on the ribs then subsequently ejected. (Ans. 8:10-13.) The Appellant’s argument that the particles are eventually ejected or “conveyed away” does not undermine the Examiner’s determination that the ribs do collect the magnetic particles. The claims do not require the collected particles to not be subsequently cleaned out or ejected away. Moreover, in discussing the operation of its device, Lehde itself describes that magnetic particles “collect on the apices of the adjacent ribs” (Lehde, 9:70-71) and refers to “[c]ollection of magnetic particles at the apices of the inclined ribs” (Lehde 4:64-65). No error has been shown in the Examiner’s

determination, and we agree with the Examiner that the ribs collect magnetic particles and thus satisfy the corresponding collector and collecting limitations of the Appellant's claims.

In the alternative, no rearrangement of what rotates is even necessary to meet the claim feature of the collector being mounted for rotation with the shaft. The surface 62 of disc 36' that carries the ribs 63 as well as the surface 61 of the magnet 60 are described as "magnetizable" surfaces that are magnetized during operation. (Lehde 4:14-18 and 8:36-43.) The Appellant's claims 1 and 9 simply call for the contaminant collector to have "magnetic characteristics." The magnetizable surface 62 that is operationally magnetized to create a magnetic field between it and surface 61 certainly has "magnetic characteristics." Disc 36', surface 62, and ribs 63 are all mounted for rotation with shaft 37. Ribs 63 located on the surface 62 form apices that collect contaminant magnetic particles and prevent those particles from moving towards shaft 37 and contacting the seal 35. Thus, disc 36' with magnetizable surface 62 and ribs 63 form a collector of magnetic particles that are mounted for rotation with shaft 37.

For all the reasons above, we sustain the Examiner's rejection of claims 1 and 9 under 35 USC § 103(a) as unpatentable over Lehde and Moskowitz.

Claims 3, 4, 11, and 12

Claims 3, 4, 11, and 12 are argued collectively as a group. Claims 3 and 11 are representative.

Claim 3 is dependent on claim 1 and introduces the additional limitation:

said contaminant collector includes a ring press fit onto said shaft.

Claim 11 is dependent on claim 9 and introduces the additional limitation:

said contaminant collectors each include a ring press fit onto said associated one of the shaft sections.

The Appellant disputes that the limitations of claims 3 and 11 are present in the prior art of record. (Br. 7:16-18.)

The Examiner found those limitations satisfied by the teachings of Moskowitz (Ans. 4:21 to 5:4):

With regard to claims 3 and 11, Moskowitz teaches the gearbox, wherein the collector is a ring that is secured to the shaft, however lacks the specific teaching of press fitting. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lehde in view of Moskowitz to employ a press fitted ring, since it is known in the art that securing a ring on a shaft may be accomplished by press fitting.

The Examiner further explained (Ans. 9:17-20):

In Col. 6, on line 29, Moskowitz teaches of the magnets 41 being secured onto the shaft 10. Also, in col. 5, lines 39-42, Moskowitz teaches of a magnet that is “force-fitted” as its means of attachment (aka press-fitted). Press-fitting is a common means of attachment within the art, and is also taught within the Moskowitz reference itself.

The Examiner has taken the position that a person of ordinary skill in the art in attaching the magnet 60 to the shaft 37 in Ledhe would do so in the known manner taught in Moskowitz. The Examiner found that the “force-fitted” attachment of a magnet to a shaft suggested in Moskowitz satisfies the “press-fit” limitations of the Appellant’s claims 3 and 11.

A combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. *KSR Int'l Co.*, 127 S. Ct. at 1739. “[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *KSR Int'l Co.*, 127 S. Ct. at 1740.

The Appellant does not address the Examiner’s reasoning to attach the magnet 60 to the shaft 37 in Ledhe in the known manner taught in Moskowitz. No error has been shown in that reasoning.

We sustain the rejection of claims 3 and 11 under 35 U.S.C. § 103(a) as unpatentable over Lehde and Moskowitz.

Claim 4 is dependent on claim 3 and claim 12 is dependent on claim 11. The Appellant does not separately argue the rejections of claims 4 and 12. Accordingly, we also sustain the rejections of claims 4 and 12 under 35 U.S.C. § 103(a) as unpatentable over Lehde and Moskowitz.

G. Conclusion

The rejection of claims 1, 3, 4, 9, 11, and 12 under 35 U.S.C. § 103(a) as unpatentable over Lehde and Moskowitz is **affirmed**.

AFFIRMED

Appeal 2008-1277
Application 09/881,115

AK

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